

A Guide for Collecting and Analyzing Data Related to Traffic Stops and Road Safety

Making sensible changes to traffic enforcement begins with good data. With the right data, you can pinpoint how police are using their traffic enforcement resources and, in turn, use those findings to craft policies that focus enforcement on dangerous driving and limit non-safety-related stops. Doing so will build road safety for everyone and reduce racial disparities. Researchers have used traffic data to calculate which infractions are causing car accidents, how much time police spend on certain stops, how many stops turn up guns, and which stops have the highest racial disparities, among many other useful conclusions.

Whenever possible, changes to traffic enforcement should be coupled with a robust data collection policy, so that the effects of the changes can be measured and the policy adjusted as necessary. If there isn't yet political support for a policy to limit non-safety-related stops, creating a data collection requirement alone is a powerful way to empirically show what needs to change.

This data toolkit provides guidance on obtaining, analyzing, and understanding data pertaining to police traffic stops and related data on road safety. The guidance focuses on non-safety-related stops—traffic stops for low-risk infractions that do not create a safety risk to anyone inside or outside the vehicle. Some examples are driving with expired registration, expired inspection/emission stickers, items hanging from the rearview mirror, or one missing headlight or taillight. In contrast, safety-related stops enforce laws around dangerous driving, such as speeding, driving under the influence, or running red lights.

Who holds the data you need?

Enforcement data: For data on traffic stops, begin by determining which law enforcement agencies make traffic stops in your area of focus. This might be local police, the county sheriff, state police, or some combination of these. Different departments may have responsibility for enforcement on different sets of roads (e.g., state highway patrol for interstate highways, sheriff's departments for rural routes, etc.), so make sure to request data from law enforcement bodies that patrol the relevant roadways.

Road safety data: For data on traffic safety—that is, data relating to crashes and fatalities—identify the agencies responsible for promoting traffic safety on the roads in your location. This will often include local and state departments of transportation or equivalent bodies.

How do you get traffic enforcement and safety data?

Enforcement data: If you are a government official, you can request enforcement data from the law enforcement agency. Be aware that it may not be as simple as asking for “any relevant data.” Some agencies are protective of this data, and you may need to make a very explicit, targeted ask for the data you need (see below for specific guidance on what to ask for). If the agency isn't collecting the relevant data, you may need to pass a data collection policy. For any jurisdictions seeking to pass or update such a policy, [the Policing Project's model statute](#) is a great place to start. Additionally, the White House has issued a useful

set of [recommendations for police data transparency](#). Vera has also developed a [model set of traffic stop data points](#) that agencies should collect.

If you are outside government, begin by looking into what data is already available. You can try a local government open data portal, the law enforcement agency's website, or a state database established by law (as in [California](#) or [Connecticut](#)). The National Conference of State Legislatures' [Traffic Stop Data page](#) is a good resource, as it details every state's laws on traffic enforcement data.

If you can't find the data you're looking for, you may need to [request the data using open records laws](#). If there's truly nothing available, you may need to advocate with your elected representative to have them ask for the data from official sources and/or pass a data collection policy.

Road safety data: Obtaining traffic safety data requires similar steps but directed toward the agency or agencies responsible for traffic safety on the roads in your location. This data can be easier to obtain than enforcement data and is more likely to be available online via state or municipal data portals.

Which specific data should you ask for?

Enforcement data: You want to get as much information as you can about each individual traffic stop: this is known as incident-level data. It might include the following:

- Time, date, duration, and location (as GPS coordinates, street address, police district, or neighborhood) of each traffic stop.
- Make, model, year, and type (e.g., passenger, commercial, taxi) of the vehicle stopped.
- Details about the driver and passengers, such as perceived race, ethnicity, age, gender, and residence.
- Information about the officer who conducted the stop, such as their police agency, unique officer ID, demographic information, and assignment (e.g., routine patrol, narcotics, highway patrol, swat team, etc.).
- Initial reason for the traffic stop.

This information should also include details on the outcome of traffic stops. Consider the following issues:

- If the officer conducted a search of any kind:
 - Who or what area was searched? This could be the car, driver, and/or passengers.
 - Why was there a search? This might include the driver/passenger/car matching descriptions of a wanted person, suspicious behavior during the stop, or a consent search (in which the officer can conduct a search for any reason, so long as the person searched gives consent).
 - What, if anything, was found? You want specifics, such as the type and quantity of drugs, weapons, or other contraband.
- Was there any use of force? This includes officers removing people from the car or handcuffing them.
- What was the enforcement outcome of the stop? Generally, there are four possible outcomes of a stop: none, a warning, a citation, or an arrest.
- If there was a citation or arrest, what were the charges and what was the outcome of the case?

Road safety data: You should also get incident-level data about traffic crashes and fatalities in your jurisdiction, containing similar information as that described above for traffic enforcement data. Key details include:

- Time, date, and location of the crash.
- Vehicles and people involved in the crash and their characteristics.

- The cause of the crash.
- Whether the crash resulted in any injuries or deaths.
- Whether there were any criminal charges or traffic summonses issued in relation to the crash.

What insights can you get from the data?

Traffic stops and road safety

Traffic stop data can tell us how effectively the police are using their traffic enforcement resources to create road safety. To understand law enforcement's role in traffic safety, look at the proportion of traffic stops focused on safety issues (like speeding and running a red light) versus non-safety-related issues (like a missing headlight or expired registration). You can also estimate the time and expense involved with non-safety-related stops to determine whether enforcement resources are well-allocated ([as California researchers did](#)).

Traffic crash data can help you understand the relationship between police enforcement priorities and road safety, beginning with how common the various causes of traffic crashes are and the prevalence of injuries and fatalities. With this data, you can calculate the amount of traffic enforcement directed to the times and places where crashes occur. From crash data, you can also determine whether the infractions being enforced via stops are related to traffic crashes in your area. For example, if data shows that 20 percent of traffic fatalities stem from drunk driving, but enforcement records show that only 2 percent of traffic stops are focused on intoxication, this is a troubling mismatch. [Researchers in Connecticut conducted an analysis of enforcement of equipment infractions and equipment problems contributing to crashes.](#) They found that the equipment issues focused on by police (like broken lights) were unrelated to the equipment problems (brake, steering, power train, and tire issues) that contributed to crashes, supporting the claim that police stops for low-level equipment infractions are unrelated to safety.

Racial disparities

You can use the data to determine whether there are racial disparities in traffic enforcement. Disparities occur when the percentage of stops for any given demographic is higher than that demographic's proportion of the overall population.

To assess racial disparities in traffic enforcement, you will need baseline data on the [driving population](#). If this isn't available, [U.S. Census data](#) for your area is an acceptable replacement and widely available.¹

You can compare the baseline population data against the traffic stop data to determine racial disparities:

- First, calculate the racial composition of traffic stops:
 - Divide the number of stops made involving drivers of a specific race by the overall number of stops. This will give you the share of traffic stops by race. Multiply by 100 to get the percentage of overall stops.
 - For example, if police made 100,000 stops in a jurisdiction in a year, and 24,000 of those stops involved Black drivers, this calculation would tell you that Black drivers accounted for 24 percent of all police stops.
- Then, compare the racial breakdown of traffic stops to the racial makeup of the population:

¹ Residential population (easily accessible via the [United States Census Bureau](#)) is not a perfect baseline, but it is adequate and widely used. In fact, census records have been shown to potentially [overcount the portion of the driving population](#) consisting of Black people, thus if anything, potentially resulting in an underestimate of disparities. For more accurate results, you can use the local driving population, which will better represent who is on the road. However, driving population estimates can be difficult or impossible to find. Another option is to collect the driver residence for each traffic stop, so that you can assess the stop rates of local and non-local drivers against the local population separately. (Montgomery County, Maryland, [used this approach](#) to determine that racial disparities in traffic stops were not a result of drivers from outside the county).

- Divide the percentage obtained in the first step by that race's percentage of the overall population. This calculation will reveal the size of the racial disparity.
 - For example, a value of three would show that people of a specific race are being stopped at triple the rate you would expect based on the local population. A rate of 0.5 would show that they are being stopped at half the expected rate.
 - Continuing the example above, if Black people made up 12 percent of the population, then dividing 24 percent by 12 percent tells us that Black drivers are being stopped at a rate double what would be expected based on their share of the local population.

This same calculation can be done for other outcomes, for example to determine whether there are disparities in who receives a warning during a stop, who gets searched, and who is subject to police use of force.

Traffic stops and public safety

You can use the data to determine how effectively the police are using their traffic enforcement resources to address issues of public safety. Important metrics include the following:

- How often traffic stops result in searches.
- “Hit rates” for narcotics and weapons (“contraband” in police parlance). There are two hit rates to consider:
 - How often traffic enforcement uncovers contraband. To determine this, divide the number of stops in which contraband was recovered by the number of stops conducted. Multiply by 100 to get the percentage of stops that lead to uncovering contraband.
 - How often searches are successful. To determine this, divide searches which uncovered contraband by the number of searches conducted. Multiple by 100 to get the percentage of searches that uncover contraband.
 - For more insight, break hit rates down by type and quantity of recovered contraband.
- Proportions of stops leading to arrest, citation, warning, or no action.
- The number of felony convictions resulting from traffic stops.
- Whether certain officers or units are making a disproportionate number of low-level traffic stops.

Generally, analysis of traffic stop data concludes that police spend an inordinate amount of time on low-level, nonmoving infractions that have very little influence on road safety or public safety and are also the stops with the highest racial disparities. This builds an evidence-driven case to end police stops for non-safety-related infractions and instead focus their resources on dangerous behavior, like reckless driving and violent crimes.

What can you determine with more advanced analysis?

The above calculations are generally manageable for anyone with the capacity to clean and organize relevant data. However, more in-depth analyses can take you even further. For example, you can use traffic safety data to identify the times and places where unsafe traffic conditions exist and collisions are more frequent (for example, roads that are conducive to high speeds at night). You can then cross-reference this with the traffic-stop data to see if police are targeting those times and places for enforcement.

Analyses can also assess whether local traffic enforcement has any significant connection with crime rates. This analysis can be used to investigate the claim frequently made by police officers that non-safety-related traffic stops are necessary to find contraband, interrupt criminal activity, and show a strong police presence,

thereby theoretically reducing crime. For example, when the Fayetteville, North Carolina police ceased making non-safety-related stops, [this kind of analysis](#) established that there was no corresponding increase in crime as a result.

If you don't have the necessary time or expertise, these analyses may require a research partner. Consider partnering with a local university, where experts in criminal justice, traffic, or data science (among other subjects) may be able to help. There are also organizations like the [Police Data Accessibility Project](#) or your local [Code for America](#) brigade that may be able to connect you with people who can help with the analysis.

There are many excellent examples of what is possible with such higher-level analysis, but a few to consult include:

- [Suspect Citizens: What 20 Million Traffic Stops Tell Us About Policing and Race](#) by Frank R. Baumgartner, Derek A. Epp, and Kelsey Shoub (Cambridge University Press, 2018)
- [“Re-Prioritizing Traffic Stops to Reduce Motor Vehicle Crash Outcomes and Racial Disparities”](#) by Mike Dolan Fliss, Frank R. Baumgartner, Paul Delamater, et al. (Injury Epidemiology, 2020)
- [“Testing for Disparities in Traffic Stops: Best Practices from the Connecticut model”](#) by Matthew B. Ross, Jesse J. Kalinowski, and Kenneth Barone (Criminology and Public Policy, 2020)
- [“Traffic Stop Policy in Ramsey County, MN”](#) by Rory Pulvino, Jess Sorensen, JJ Naddeo, and Jared Fishman (Justice Innovation Lab, 2023)